

Title:

Scientific Animation: A Technique for Communicating Volcanic Hazard Information in the Next Decade

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Abstract:

Computing and communication technologies evolve over the next decade; volcanologists will have access to an increasing number of tools for disseminating information. At JPL's Digital Image Animation Laboratory, we are exploring the use of scientific animation techniques to visualize dynamic volcanic phenomena. The goal of our research is to provide volcanologists and disaster managers with the tools to produce animations that illustrate the potential hazards of volcanic activity and describe courses of action that might mitigate these hazards. The visual representation of hazard information is an efficient means of communication, and animations can be designed to be both compelling and independent of language or culture. The animations can be distributed on videocassette, broadcast over local airwaves, and disseminated over the Internet in a variety of formats, thus maximizing the penetration of this information within the local populace. We are using commercial, off the shelf animation software and desktop workstations in our research to ensure the tools for producing scientific animations are within the means of volcanologists and disaster managers. Commercial animation software emphasizes artistic photorealism over scientific accuracy, and one of the objectives of our research is to incorporate phenomenological models into the production of an animation. To accomplish this goal, we must map the states of the model parameters at each step in a simulation to the states of graphical elements within the animation. Our preliminary results, which do not incorporate phenomenological models, suggest that photorealistic animations can convey scientific information and illustrate scientific principles. Our objectives are to enable and promote the use of scientific animation within the volcanological community in the coming decade